CITY OF SCOTTSDALE

Drainage Reports

PRELIMINARY DRAINAGE REPORT

Senior Living at McDowell Mountain Ranch

SCOTTSDALE, ARIZONA

Prepared for:

RYAN A+E, INC.
3900 E. Camelback Road Ste 100
Phoenix, Arizona 85018

Prepared by:

LANDCOR CONSULTING
2663 E. Hobart Street
Gilbert, Arizona 85296
(480) 223-8573

May 13, 2019
Job #1617

PRELIMINARY DRAINAGE REPORT
FOR
SENIOR LIVING AT MCDOWELL MOUNTAIN RANCH

TABLE OF CONTENTS

I. PROJECT DESCRIPTION

This Project is a proposed 161 unit senior care facility on a vacant 5 acre parcel located east of 98th Street on the south side of McDowell Mountain Ranch Road (see Figure 1). Site development consists of a single building with three floors with separate entrances and drop-off areas for independent/assisted and memory care. A large triangular area at the northeast corner of the property contains a remnant of the little-known old Rio Verde Canal (berm) which has been reclaimed by dense native vegetation and will be left untouched.

The property is a portion of the southwest quarter of Section 5, Township 3 North, Range 5 East of the Gila and Salt River Base and Meridian. The property is bound by McDowell Mountain Ranch Road to the north and undeveloped properties on the East, West and South sides.

The purpose of this report is to present a drainage design that is in compliance with City of Scottsdale's *Design Standards & Policies Manual* (DS&PM) and is compatible with the existing development.

II. FLOOD PLAIN DESIGNATION

The majority of this site is located within Zone "X" as shown on the FEMA Flood Insurance Rate Map 04013C1340L dated October 16, 2013 (see Figure 2 in Appendix A). Flood Zone "X" is defined as:

> "areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood."

The southwest corner of the site is slightly impacted by Zone "A". Zone "A" is Special Flood Hazard Area (SFHA) without a defined Base Flood Elevation (BFE). This SFHA includes inundation limits caused by the Central Arizona Project (CAP) canal and basin.

III. EXISTING CONDITIONS

The site and surrounding areas generally drain in a southwesterly direction towards the CAP basin. There is a significant upstream watershed that has a major impact on area drainage conditions as discussed below. This watershed has been analyzed in detail and is described most recently in a report titled *Southwest Corner Thompson Peak Parkway & McDowell Mountain Ranch Road Preliminary Drainage Report* by Erie and Associates dated May 8, 2019 (see excerpts in Appendix B).

As shown in Figure 3, storm water runoff from the upstream areas northeast of the Rio Verde Canal (RVC) pond along the north side of the existing

embankment from McDowell Mountain Ranch Road (MMRR) to Thompson Peak Parkway (TPP). Upstream flows are conveyed through 2-3'x'8 box culverts and since there is no outfall due to the construction of the TPP roadway, existing runoff ultimately ponds and reverses direction northwesterly to where the RVC intersects MMRR. From there, minor flows are conveyed northwesterly across MMRR via 2-24" RCP culverts. During a major storm event the culverts capacity is exceeded and storm water overtops onto MMRR, flows onto the subject property, and then continues south to the CAP basin.

The remainder of the site is generally protected from significant offsite flows by the RVC berm. All runoff exiting the site flows directly to the CAP Basin.

IV. PROPOSED DRAINAGE PLAN

General

Stormwater storage basins will be provided on-site as discussed below. Runoff will be conveyed to the proposed basins by a combination of surface drainage and underground storm drain facilities. Calculations and sizing for underground storm drain pipes and appurtenances will be provided with the final design.

Rio Verde Outfall Channel

The owners of the three affected privately-owned properties on the south side of MMRR from TPP to 98th Street are requesting approval of a Master Drainage concept that will provide the basis for site design and immediate development of the subject property (see Appendix C). This Master Drainage concept will also mitigate the negative drainage conditions along the RVC on adjoining properties as well as McDowell Mountain Ranch Road (MMRR). City staff has reviewed and accepted the proposal with stipulations (Appendix D).

The proposed drainage concept includes the construction of an outfall channel south of the RVC as shown in Figure 4 and provides a direct connection for offsite flows to reach the CAP basin thereby eliminating most of the drainage/ponding impacts currently experienced by the adjoining properties. This proposed channel route would extend the existing riprap channel south of MMRR to an existing wash with adequate capacity located on the Arizona State Land Department property.

Stormwater Storage

This project will pursue a full waiver of stormwater storage requirements based on waiver criteria 1 which is based on adequate capacity of downstream facilities to convey additional runoff in accordance with City of Scottsdale's DS&PM. The project will be subject in lieu fees for the volume waived above the pre versus post requirement. Stormwater storage facilities will be constructed on-site to store runoff from rainfall events up to and including the first flush volume. Runoff in the adjacent half street will not be included in the volume provided on-site and therefore will also be subject to in lieu fees. Calculations for the on-site stormwater storage volumes required and provided are presented in Appendix E.

On-site contributing drainage areas are shown in Figure 5. The City of Scottsdale Stormwater Waiver is included in Appendix F.

Stormwater Storage will be provided in two separate surface basins located along the south boundaries of the site as shown in the *Preliminary Grading & Drainage Plan* (Figure 6). The detention basins are designed in accordance with City of Scottsdale's DS&PM.

The flood limits that are represented by FEMA Zone "A" are part of the CAP Basin. The volume displaced due development of this site is minimal and therefore is not included in the stormwater storage calculations.

Stormwater Disposal

All stormwater storage facilities will be designed such that stored runoff will be discharged completely from the facility within 36 hours following the storm event. The basins will be constructed with a gravity bleed-off system which will be sized during final design.

Lowest Floor Elevations

Lowest floor elevations and/or flood proofing elevation(s) are sufficiently high to provide protection from flooding caused by a 100-year storm, and are in accordance with Scottsdale's revised code, chapter 37-Floodplain & Stormwater Regulation.

V. CONCLUSIONS

- The project is mostly within FEMA Zone "X" with a small area of Zone "A".
- The site does not have any Army Corp. of Engineers jurisdictional areas requiring a 404 Permit.
- This project will comply with the National Pollutant Discharge Elimination System (NPDES) program. A Notice of Intent (NOI) will be submitted to ADEQ and an Authorization to Discharge (ATD) letter will be obtained prior to construction. The total area of disturbance is approximately 5 acres.
- This project will pursue a full waiver of stormwater storage requirements in accordance with City of Scottsdale's DS&PM.
- Stormwater storage facilities shall be maintained so as not to cause or contribute to the creation of a public nuisance. At a minimum, maintenance shall include the removal of all debris and sediment from stormwater storage facilities immediately following a storm event.
- All stormwater storage facilities will be designed to drain within 36-hours of the rainfall event.

- Lowest floor elevations and/or flood proofing elevation(s) are sufficiently high to provide protection from flooding caused by a 100-year storm, and are in accordance with Scottsdale's revised code, chapter 37-Floodplain & Stormwater Regulation.

- This Project will not adversely impact drainage conditions on adjacent properties.

APPENDIX A

FIGURES

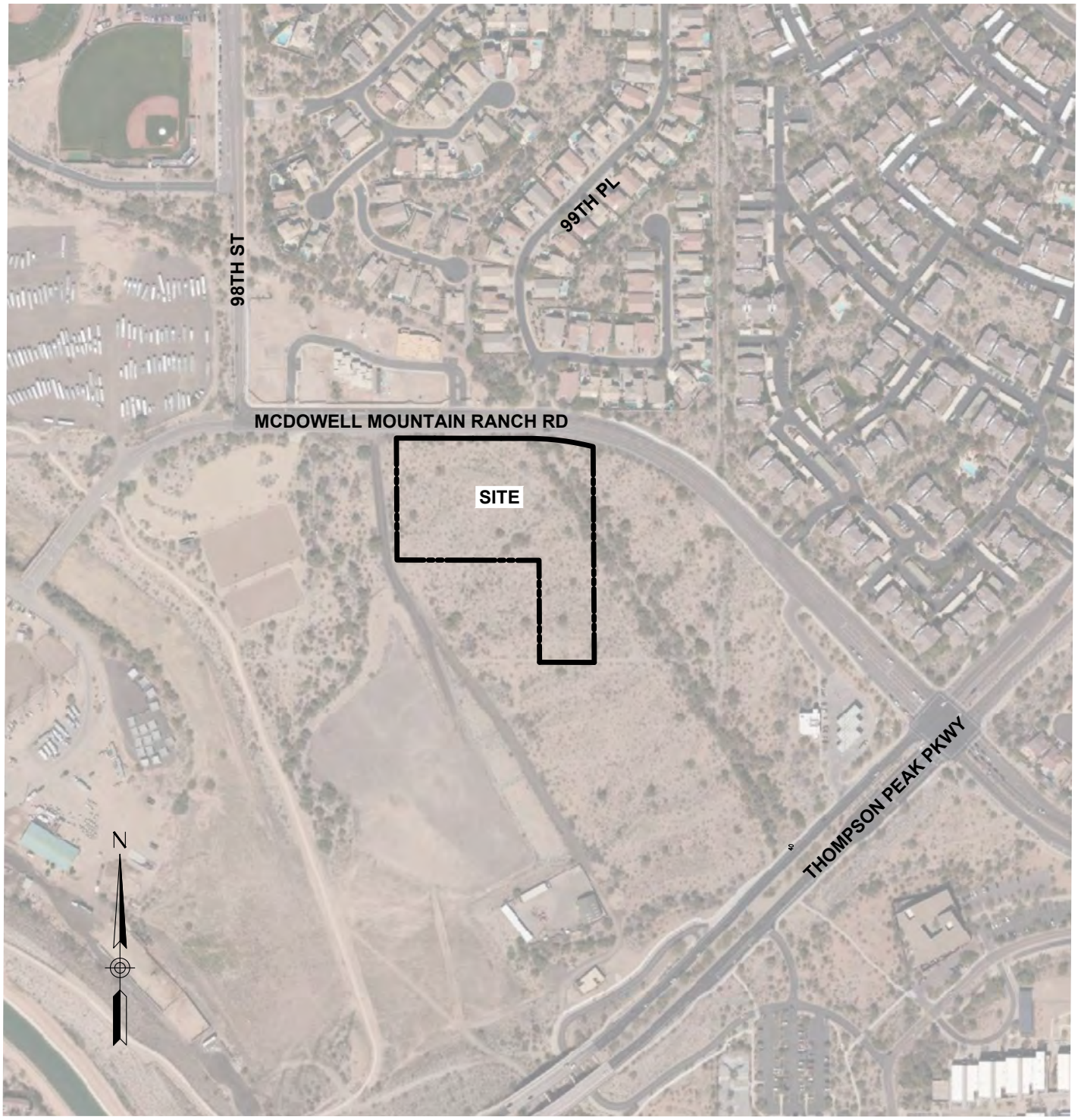


FIGURE 1
LOCATION MAP

National Flood Hazard Layer FIRMette

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

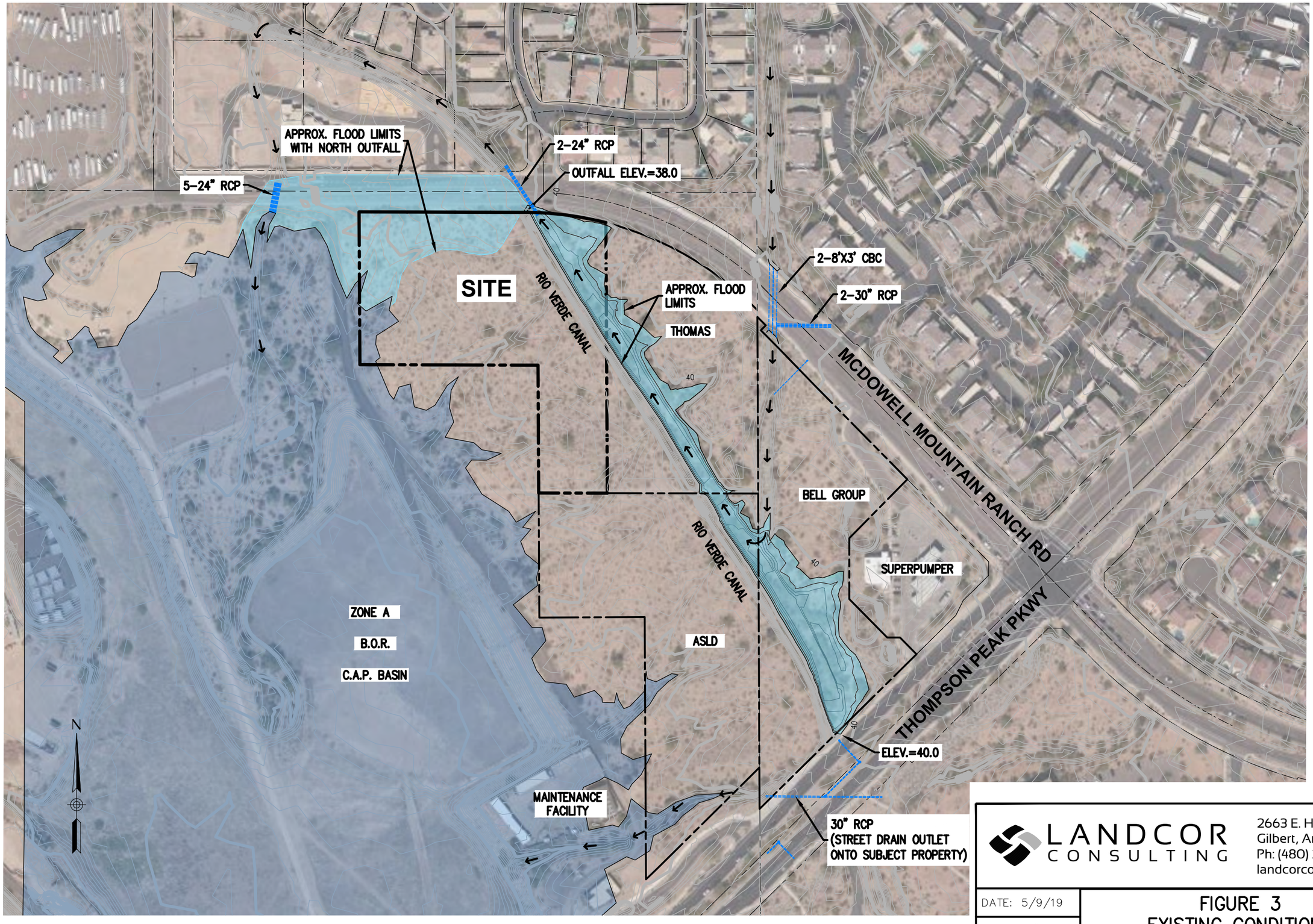
N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/10/2019 at 3:05:04 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



LANDCOR CONSULTING
2663 E. Hobart Street
Gilbert, Arizona 85296
Ph: (480) 223-8573
landcorconsulting.com

DATE: 5/9/19

SCALE: 1"=200'

FIGURE 3
EXISTING CONDITIONS

LANDCOR CONSULTING
2663 E. Hobart Street
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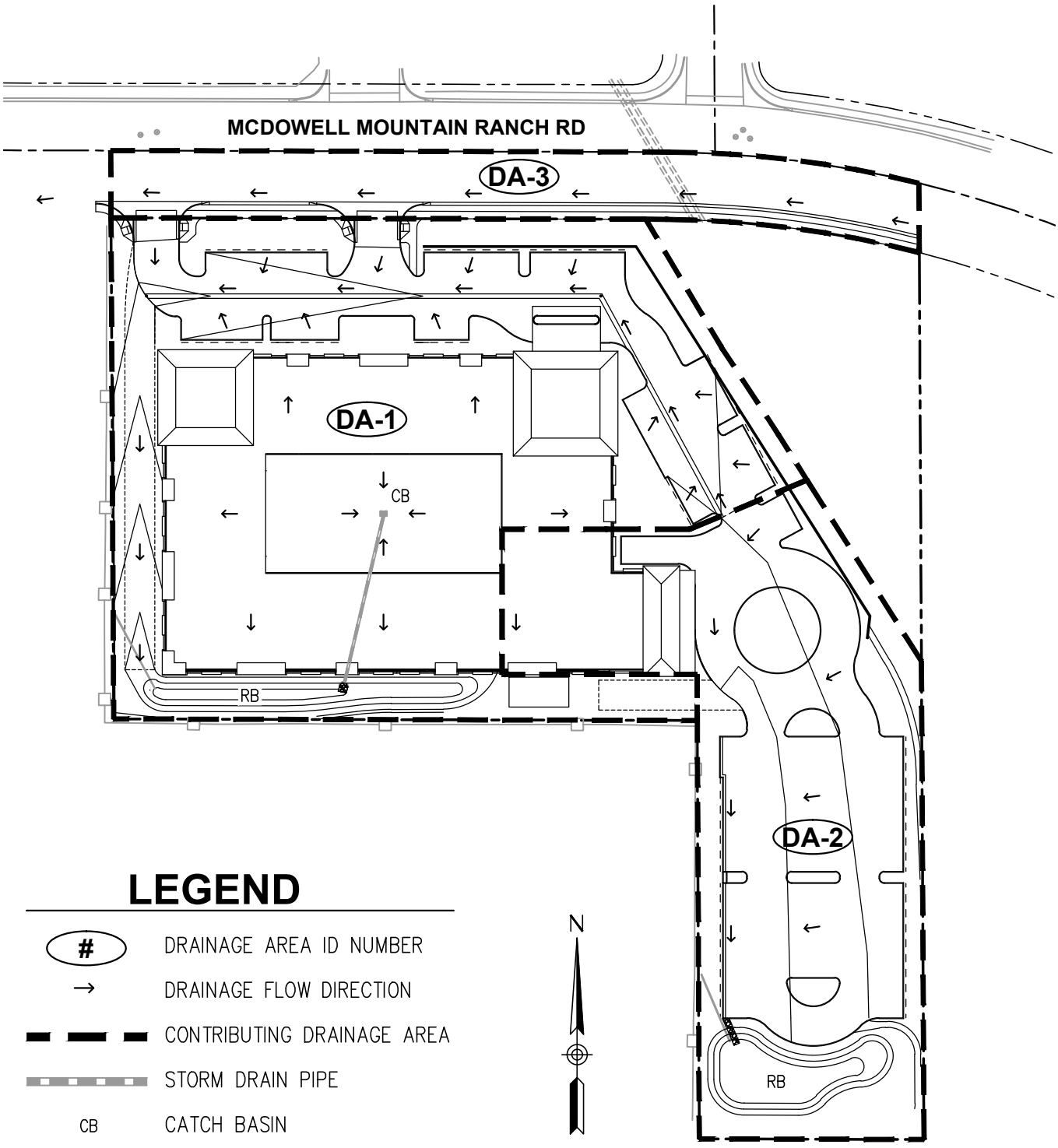
Ph: (480) 223-8573
landcorconsulting.com

DATE: 5/9/19

SCALE: 1"=200'

FIGURE 4
PROPOSED SOUTH OUTFALL



LEGEND

#	DRAINAGE AREA ID NUMBER
→	DRAINAGE FLOW DIRECTION
- - -	CONTRIBUTING DRAINAGE AREA
═══	STORM DRAIN PIPE
CB	CATCH BASIN
RB	RETENTION/DETENTION BASIN

LANDCOR CONSULTING
6859 E. Rembrandt Ave, 124
Mesa, AZ 85212
Ph: (480) 223-8573
landcorconsulting.com

SCALE: 1"=100'

FIGURE 5
ON-SITE DRAINAGE AREA MAP

JOB NO. 1617

APPENDIX B

Excerpts from *Southwest Corner Thompson Peak Parkway & McDowell Mountain Ranch Road Preliminary Drainage Report*

by Erie & Associates

Southwest Corner Thompson Peak Parkway & McDowell Mountain Ranch

Preliminary Drainage Report

Prepared for:

George Bell/George Bell III
Land Research and Development, Inc.
18061 North 99th Street
Scottsdale, AZ 85255

For submittal to:

City of Scottsdale

Case No. 23-ZN-2018

Prepared by:

Erie & Associates, Inc.
3120 North 24th Street
Phoenix, AZ 85016

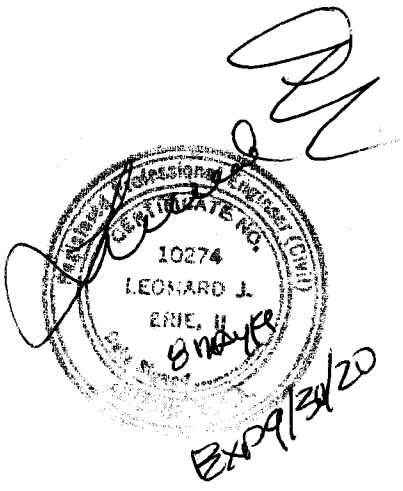
EA #2305.01

May 8, 2019

1.0 Table of Contents

List of Appendices

2.0 List of Plates and Tables



3.0 Location/Description

The 5± acre project site is located in the City of Scottsdale, Arizona at the southwest corner of Thompson Peak Parkway and McDowell Mountain Ranch Road. The site is a portion of the southeast quarter of Section 5, Township 3 North, Range 5 East of the Gila and Salt River Base and Meridian. See *Plate 1 – Location Map.*

This property is Parcel K of the McDowell Mountain Ranch Development. The property is on an ESL area and will meet current storage requirements for that ordinance.

The site is bisected by the Old Verde Canal which cuts across the site from northwest to southeast. Drainage in the area is generally from north to south and on a much flatter slope from east to west. Modifications to the Old Verde Canal are proposed to route flows south to an existing wash that runs to the CAP Dike Ponding area.

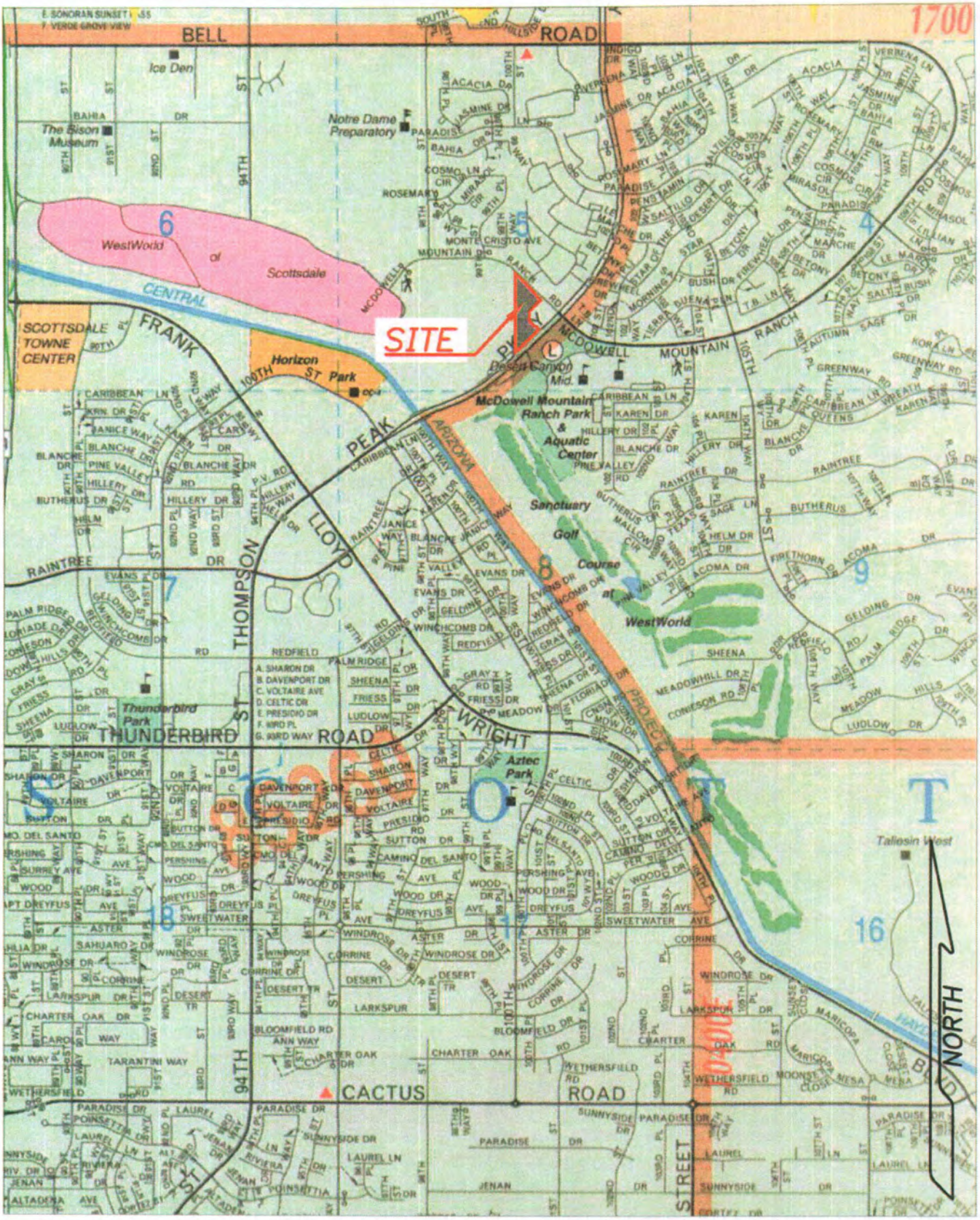
3.1 FEMA Data

The site is located on FEMA Map #04013C1340L dated October 16, 2013. The site is located in a FEMA Shaded Zone "X". A copy of the map is included as *Plate 2 – FEMA MAP.* A FEMA shaded Zone "X" is defined as "an area of 0.2% annual chance flood; area of 1% annual chance flood with average depths of less than one foot or with drainage areas less than one square mile; and areas protected by levees from 1% annual chance flood.

3.2 Drainage Concepts

- Under existing conditions, peak flows leave the site along the west boundary on the north side of the Old Verde Canal. The runoff ponds behind the Old Verde Canal and eventually spills to the west through a breach in the canal at McDowell Mountain Ranch Road.
- For proposed conditions, the Old Verde Canal will be breached. Runoff will be conveyed by a proposed channel that discharges at the southwest corner of the property at the historic location.
- The existing gas station basin will be reconfigured to be located entirely on the gas station site. The approval to do this will be obtained with the final plans.

- This site will provide the greater of pre/post 100 year -2 hour or first flush retention for containment of flows off the service station site.
- The first flush flows from the remaining developed portions of the site will be detained in the existing ponding area behind the Old Verde Canal west of the proposed breach.



JOB NO.	2305.01
DATE:	12/21/2018
SCALE:	1"=2000'

ERIE & ASSOCIATES, INC.
3120 NORTH 24th STREET
PHOENIX, ARIZONA 85016
(602) 954-6399

Southwest Corner Thompson Peak Parkway & McDowell Mountain Ranch

PLATE 1 – LOCATION MAP

JOB NO. 2305.01 DATE: 12/21/2018 SCALE: 1"=1000'	ERIE & ASSOCIATES, INC. 3120 NORTH 24th STREET PHOENIX, ARIZONA 85016 (602) 954-6399	Southwest Corner Thompson Peak Parkway & McDowell Mountain Ranch PLATE 2 – FEMA MAP

4.0 Hydrology

A hydrologic analysis was completed for this project to determine the offsite flows for existing and developed conditions. The peak flows for the 100-year, 6-hour storm event were calculated using the United States Army Corps of Engineers HEC-1 computer program. Rainfall data is based on the latest NOAA 14 guidelines. Rainfall losses were determined using the Green and Ampt loss rate method and the Clark Unit Hydrograph was used for hydrograph routing. Soil information used in this study was taken from the USDA Soil Conservation Service "Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Arizona". See *Appendix A* for hydrologic data and calculations. The methodology used to calculate peak flows is consistent with the requirements outlined in the "Drainage Design Manual for Maricopa County, Arizona". The hydrologic calculations and basin characteristic calculations are included in *Appendix A*. The HEC-1 input/output is included in *Appendix B*.

4.1 Existing Hydrology

An existing conditions hydrologic analysis was completed for this project to determine the peak flows for the 100-year, 6-hour storm event. The existing HEC-1 Input/Output is included in Appendix B. The tributary areas were delineated using a combination of means, including: a USGS quad map, Maricopa County topography, new onsite topo, aerial photos, and field reconnaissance. The model includes an existing ponding area along the Old Verde Canal. The spill out from this reach of the canal is on the west. Ponding elevations are included in Table 5.

There is an existing flow split north of McDowell Mountain Ranch Road at an existing box culvert. Flows out of that split would recombine before splitting out through the opening in the Old Verde Canal at the roadway opening to the west. For that reason, the split was ignored to preclude the possibility of future regrading in the area that would direct more flow to the site. The existing model includes the gas station and the existing basins on the site.

See *Plate 3 – Tributary Map* for tributary areas. See *Table 1 – Existing Conditions Sub-Area Parameters* for the existing hydrologic parameters and *Table 2* for the existing Green and Ampt loss rate parameters. See Plate 4, existing master drainage plan for existing basins onsite and along the Old Verde Canal.

Table 1 – Existing Conditions Sub-Area Parameters

Sub-Area	Area (sq mi)	Length (mi)	Adjusted Slope (ft/mi)	Tc	R
SA-01	0.024	0.19	157.9	0.148	0.099
SA-02	0.090	0.48	129.2	0.235	0.162
SA-03	0.002	0.06	181.8	0.078	0.079
SA-04	0.001	0.06	181.8	0.080	0.120
SA-05	0.007	0.11	136.4	0.196	0.176
SA-06	0.009	0.10	10.0	0.415	0.324

Table 2 – Existing Conditions Green and Ampt Loss Rate Parameters

Sub-Area	IA	DTHETA	PSIF	XKSAT	RTIMP
SA-01	0.25	0.29	2.75	1.339	45
SA0-2	0.25	0.29	2.75	1.339	45
SA-03	0.10	0.29	2.75	1.497	80
SA-04	0.10	0.29	2.75	1.497	80
SA-05	0.30	0.35	2.75	1.004	15
SA-06	0.30	0.35	2.75	0.995	16

4.2 Developed Hydrology

The developed sub area parameters are included as *Table 3 and, Table 4* includes the Developed Green and Ampt Loss Rate Parameters. The HEC-1 input/output is included in *Appendix B.* The developed model includes the reconfigured gas station basin and storage/pads area basin.

Table 3 – Developed Conditions Sub-Area Parameters

Sub-Area	Area (sq mi)	Length (mi)	Adjusted Slope (ft/mi)	Tc	R
SA-01	0.024	0.19	157.9	0.148	0.099
SA-02	0.090	0.48	129.2	0.235	0.162
SA-03	0.002	0.06	181.8	0.078	0.079
SA-04	0.001	0.06	181.8	0.080	0.120
SA-05	0.007	0.11	136.4	0.166	0.146
SA-06	0.009	0.10	10.0	0.415	0.324

Table 4 – Developed Conditions Green and Ampt Loss Rate Parameters

Sub-Area	IA	DTHETA	PSIF	XKSAT	RTIMP
SA-01	0.25	0.29	2.75	1.339	45
SA0-2	0.25	0.29	2.75	1.339	45
SA-03	0.10	0.29	2.75	1.497	80
SA-04	0.10	0.29	2.75	1.497	80
SA-05	0.12	0.34	2.75	1.042	58
SA-06	0.30	0.35	2.75	0.995	16

4.3 Hydrologic Results

The peak flows are shown on *Plate 4 – Master Drainage Plan* for existing and developed conditions and are in *Table 5-Peak Flows at Key Locations.*

Table 5 – Peak Flows at Key Locations

HEC-1 ID	Description	Flow Existing (CFS)	Flow Developed (CFS)
CP.A	**Peak flow entering the site from the north at McDowell Mountain Ranch Road and the 100th Street Alignment.**	**216**	**216**
CP.B/RB.3&4	**Peak flow entering the site from the east off of the gas station site.**	**3/3**	**8/0**
CP.C	**Peak Flow leaving the site at the Old Verde Canal ponding area**	**226**	**228**
CP.D	**Peak Flow into the ponding area to the south at the Old Verde Canal**	**231**	**233**
RB.6 Ex	**Existing Peak Flow out of the ponding area behind at the Old Verde Canal at McDowell Mountain Ranch Road west of the site**	**152 Ponding WS= 1538.92**	**N/A**
RB.6 Dev	**Peak Flow south through the breach in the Old Verde Canal**	**231**	**233**

The area downstream of the site along the Old Verde Canal outfalls at elevation 1537.00, at the opening in the dike to the west. The existing water surface elevation on the 100 year – 6 hour storm is WS=1538.92 For developed conditions, the ponding area is considered ineffective because the proposed Old Verde Canal breach is designed to carry the entire incoming flow, and minimal attenuation of flow would occur.

A 30" pipe enters the channel at Sec 457. The pipe has a capacity of 52 cfs for a total of 285 cfs. The analysis is in *Appendix A.*

5.0 Hydraulics

The hydraulic analysis for this project was performed using the United States Army Corps of Engineers HEC-RAS Computer Program Version 4.1.0. Developed conditions were analyzed for the study reach. The calculations are included as *Appendix A*. The input/output is included as *Appendix B*. The developed condition includes a new west channel to contain the design flow of 216 cfs.

5.1 Developed Hydraulics

The developed conditions HEC-RAS hydraulic model was constructed using proposed grading from Landcor Consulting. The purpose is to show the proposed and existing buildings are above 100 yr. water surfaces. The Manning's n value is 0.045 for the proposed rock lined channel and 0.06 for the channel downstream of the breach. The 0.06 for the new channel reflects a proposed dense native vegetation liner in the channel. The results are summarized in *Table 1 – Water Surface Elevation Summary* and are shown on *Plate 4 – Master Drainage Plan.*

Table 6 – Water Surface Elevation Summary

HEC-RAS Section ID	Peak Flow CFS	W.S. Elevation (developed)	Channel Velocity (fps)
-80	285	1520.38	6.22
48	285	1523.41	3.86
106	285	1524.18	4.08
162	285	1525.82	4.86
207	285	1526.38	4.38
294*	285	1527.78	5.85
365*	285	1529.31	7.15
457*	285	1532.49	5.46
643	233	1534.39	3.93
796	233	1535.25	4.33
915	233	1536.02	4.21
988*	216	1536.53	4.12
1000*	216	1538.84	6.72
1043*	216	1540.00	6.00
1087*	216	1540.89	6.45
1187*	216	1542.56	4.29
1287*	216	1543.40	4.69
1387*	216	1544.40	4.70

*Rock lined channel areas

The results show that the building along the channel is stepped in grade at approximately section 1187. The water surface elevation is ws=1542.56 and the lower finish floor is ff=1543.00. The upper finish floor is ff=1547.00 and the water surface elevation at the upstream side is ws=1544.40 (Section 1387). Rock sizing for the upper portion of the channel will be done on the final report. The velocity in the lower portion of the channel is approximately 4 fps and will be stable with heavy native desert planting. The connection to the existing channel will be armored with loose stone for approximately 150 feet below the connection point.

THOMPSON PEAK & MCDOWELL MOUNTAIN RANCH

PLATE 3 - TRIBUTARY MAP (C.O.S. TOPOGRAPHY)

1981 – 2016
35 YEARS OF EXCELLENCE
ERIE & ASSOCIATES

Professional Engineer Certificate
10274
LEONARD J. ERIE
ARIZONA, U.S.A.
EXP. 09/30/20

ERIE & ASSOCIATES, INC.
3120 N. 24th ST.
PHOENIX, ARIZONA 85016
(602) 954-0399

JOB NO. 2305.01
DATE: 04/11/2019
SCALE: 1"=200'
DRAWN: J.A.L.
DESIGN: L.J.E.
CHECKED: L.J.E.
SHEET NO.
PLATE 3
2 OF 2

APPENDIX C

RIO VERDE CANAL – PROPOSED DRAINAGE SOLUTION

Michael P. Leary, LTD
10278 E. Hillery Drive
Scottsdale, Arizona 85255

(480) 991-1111
michaelpleary@cox.net

Date: March 13, 2019

To: Richard Anderson, Scottsdale Stormwater Management

Cc: Ashley Couch, Scottsdale Stormwater Management
Don Gerkin, Scottsdale Stormwater Management
Randy Grant, Scottsdale Planning and Development Services

From: Mike Leary

Subject: **Rio Verde Canal - offsite flow conveyance - proposed solution**

Richard thanks for your continued support to dislodge - literally - the Rio Verde Canal (RVC) logjam. The attached letter is in response to your request for a brief narrative which describes the flooding and impoundment problem, the history of the problem and our proposed solution. **Our goal is to reach an agreement with the City that provides a drainage solution beneficial to all parties.**

The owners of the three affected privately-owned properties on the south side of MMRR from TPP to 98th Street have authorized the submittal of the attached letter, the solution of which remedies the flooding problems on their properties, the northeast portion of the ASLD parcel and McDowell Mountain Ranch Road. The City's support of the proposed solution also eliminates the City's liability caused by the failure to convey off-site flows directly to the BOR Basin as required by the 1992 MMR zoning drainage stipulations and the MMR master drainage plan and to ultimately construct - per the City approved plans for Thompson Peak Parkway - the outfall at the Rio Verde Canal which would have precluded the current drainage problem.

As the drainage issue has been thoroughly examined and discussed, we respectfully request that the City expeditiously approve the proposed solution and method of implementation as this unresolved issue directly affects the scheduled closing of the Spensa/Bell property on March 29th.

Thanking you in advance,

SPENSA ARIZONA XV LLC
THE BELL GROUP LLC

George H. Bell

JAT DOVE CAPITAL LLC

John G. Thomas

WINSTAR PRO LLC

Dr. Stephen J. Weiss

LANDCOR
CONSULTING

6859 E. Rembrandt Ave, #124
Mesa, AZ 85212

March 15, 2019

Mr. Richard Anderson
Stormwater Review Manager
City of Scottsdale
7447 E. Indian School Road
Scottsdale, AZ 85251

Re: **McDowell Mountain Community Storage**
23-ZN-2018
Rio Verde Canal Outfall

The purpose of this letter is to summarize the results of our findings and present a justification for a Rio Verde Canal (RVC) outfall to be located on the subject property. We are requesting staff approval of this Master Drainage concept that will provide the basis for site design and immediate development of the subject property. This Master Drainage concept will also mitigate the negative drainage conditions along the RVC on adjoining properties as well as McDowell Mountain Ranch Road (MMRR).

As shown in Figure 1, storm water runoff from the site and upstream areas northeast of the RVC pond along the north side of the existing embankment from MMRR to Thompson Peak Parkway (TPP). Upstream flows are conveyed through 2-3'x'8 box culverts and since there is no outfall due to the construction of TPP, existing runoff ultimately ponds and reverses direction northwesterly to where the RVC intersects MMRR. From there, minor flows are conveyed northwesterly across MMRR via 2-24" RCP culverts. During a major storm event the culverts capacity is exceeded and storm water overtops onto MMRR, flows onto the Winstar property, and then continues south to the C.A.P. basin.

Maintaining the existing condition negatively affects the adjacent properties and the City of Scottsdale for the following reasons:

1. As previously stated, storm water flows at the existing outfall at MMRR currently exceed the capacity of the culverts in the roadway and during a major storm event results in flooding of MMRR impacting the City and downstream properties and the service road to the Westworld maintenance facility.
2. Upon development, properties would be required to provide compensatory storage for the displaced volume of ponded storm water along the RVC or the ponded areas would have to remain undeveloped.
3. FEMA does not recognize the RVC embankment as a levee and therefore would not recognize its ability to protect downstream properties from potential flooding due to failure of the embankment. Downstream properties would need to consider this flooding potential with any site development.

Construction of an outfall channel south of the RVC as shown in Figure 2 provides a direct connection for offsite flows to reach the C.A.P. basin thereby eliminating most of the drainage/ponding impacts currently experienced by the adjoining properties. This proposed route would extend the existing riprap channel south of the RVC to the existing wash at the southern tip of the property. This solution provides a direct route for flows, is the most logical route, and is supported by the impacted property owners.

We believe that this Master Drainage concept is the best solution to these local drainage problems for the following reasons:

- The proposed outfall is consistent with the attached MMR 1992 zoning stipulations (Exhibit A), the MMR Master Drainage Plan and other previous hydrologic/hydraulic studies in the area. We are proposing to convey the water south directly to the C.A.P. basin as recommended in the MMR Master Drainage Plan Option 1 (Exhibit B).
- There is adequate capacity downstream.
- Construction of the outfall has been planned/designed but never constructed per the following attachments:
    1. MMR Master Drainage Plan (Exhibit B)
    2. Giant Gas Station (Exhibit C)
    3. TPP Extension drainage design (Exhibit D)
    4. Romanza at TPP (Exhibit E)
- The existing northwest outfall is not controlled and during a major storm event would cause flooding in MMRR as previously discussed and illustrated in Figure 1. The proposed south outfall would reduce if not eliminate this problem.
- The existing northwest outfall creates significant flooding potential not only on MMRR but also the Winstar property west of the canal south of MMRR. The south outfall route alleviates the problem for the City roadway, the Winstar property owner, and Westworld service road.
- The south outfall to the existing wash solves the compensatory storage volume problem for the property owners and the City.
- There is precedent for utilizing the downstream wash for conveyance. As shown in Figure 1, TPP street drainage is conveyed via a 30" RCP which discharges to the existing wash at the south end of the subject property in the same location as the proposed outfall.
- Storm water would discharge into an existing and historical natural wash system on the ASLD property already designated as Zone A floodplain. This solution provides the northeast portion of the ASLD property the ability to eliminate compensatory storage by eliminating ponding behind the RVC embankment. It also removes flooding potential on the ASLD property that would be caused by failure of the embankment.

March 15, 2019

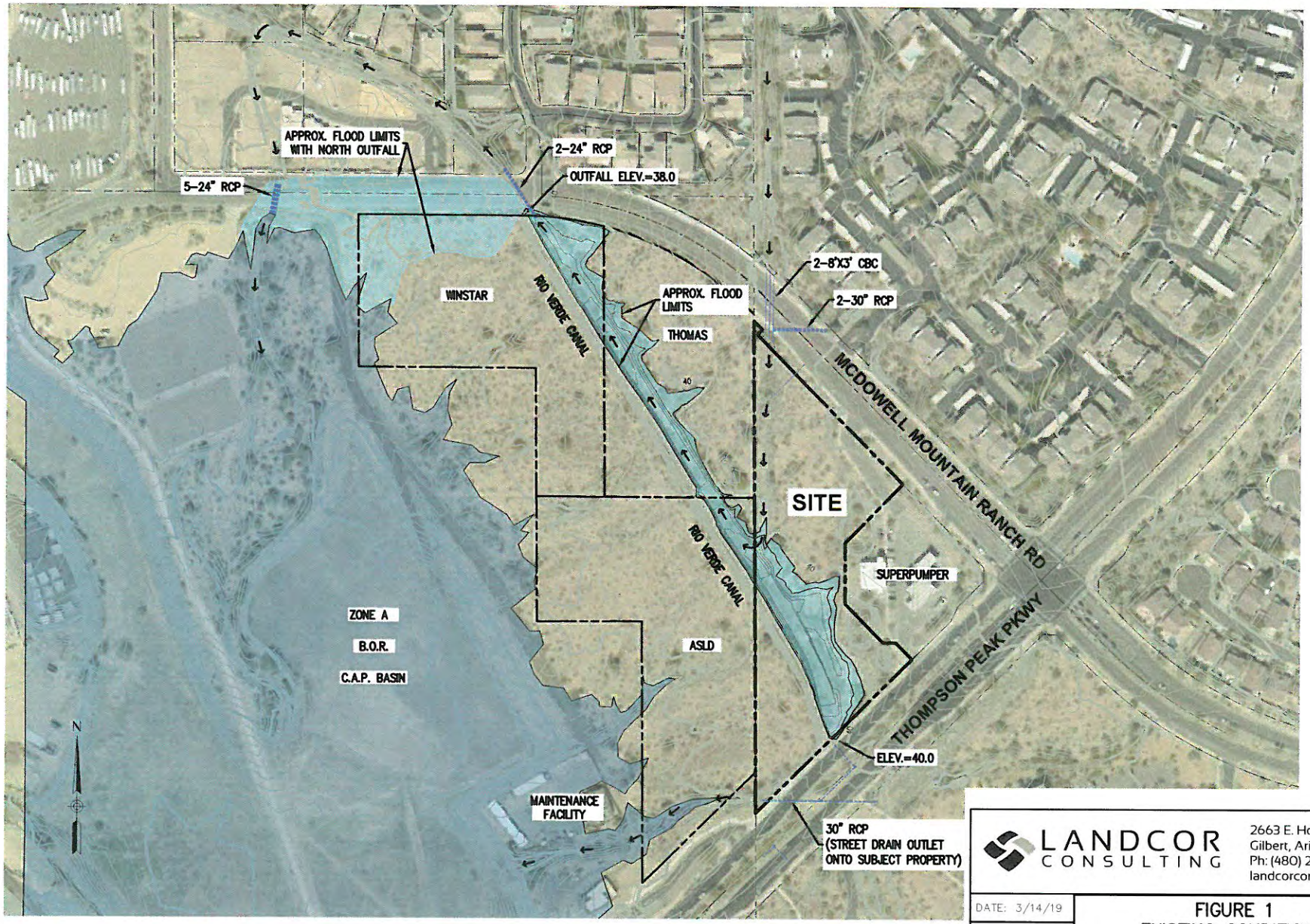
This Master Drainage approach solves local drainage problems impacting the City's roadway and the negative impacts on developing the affected properties. Please feel free to contact me if you have any further questions or need additional clarification (480-223-8573).

Sincerely,

Wade E. Cooke, P.E.
Landcor Consulting, PC

Attachments

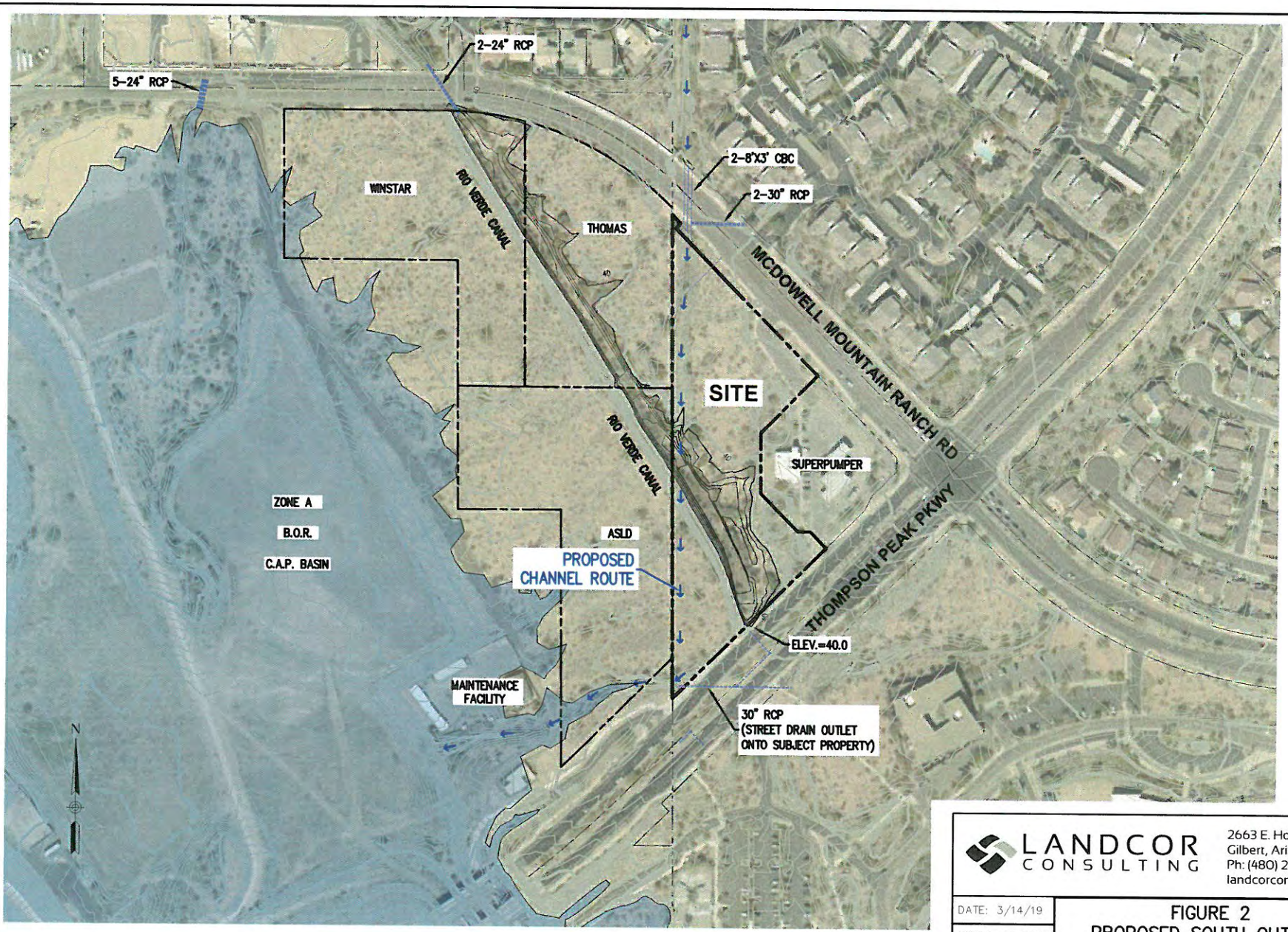
Cc: George Bell
George Bell III
John Thomas
Stephen Weiss
Mike Leary
Len Erie
Mike Delmarter



LANDCOR CONSULTING
2663 E. Hobart Street
Gilbert, Arizona 85296
Ph: (480) 223-8573
landcorconsulting.com

DATE: 3/14/19
SCALE: 1"=200'

FIGURE 1
EXISTING CONDITIONS



LANDCOR CONSULTING
2663 E. Hobart Street
Gilbert, Arizona 85296
Ph: (480) 223-8573
landcorconsulting.com

DATE: 3/14/19
SCALE: 1"=200'

FIGURE 2
PROPOSED SOUTH OUTFALL

DRAINAGE AND FLOOD CONTROL

1. The following stipulations are intended to supplement, but not in any manner reduce or eliminate, the applicants obligations and responsibilities under the City's Floodplain and Drainage Ordinance, Scottsdale Code, Chapter 37. Under the City's Floodplain and Drainage Ordinance, the applicant is responsible for management of all stormwater generated on the property, and all stormwater generated off the property which historically crossed the Property. Management requirements and practices shall be as specified in the Scottsdale Code, and applicable portions of the City of Scottsdale General Plan and Design Procedures and Criteria.

2. The applicant proposes that onsite retention/detention requirements be waived for development within the McDowell Mountain Ranch. Only those areas of McDowell Mountain Ranch development which can fulfill the following requirements will be considered for waivers from the stormwater storage requirements.

   a. The applicant shall show that the runoff has been included in a storage facility at another location. The runoff from this site must be safely conveyed to the other location, generally assumed to be the retention area behind the C.A.P. dike, through an existing watercourse or a man made watercourse which has been adequately designed and constructed to convey at least the 100-year event.

   b. The developer must provide engineering analysis to city staff which demonstrates to the satisfaction of city staff that the watercourse does have the additional capacity and the potential for flooding downstream properties won't be increased.

3. In lieu of providing stormwater retention/detention, in those areas which meet the criteria set forth in 2a and 2b above, the applicant shall contribute services, construction, or cash fees to be applied to the design and construction of community off-site drainage and flood control facilities. In-lieu contributions must be designated and agreed upon by the city and the applicant prior to issuance of permits. In-lieu fees will not be required if the applicant fulfills the requirements of items 2a and 2b above by constructing facilities which safely convey stormwater falling on the subject property and stormwater which historically crossed the property to regional retention/detention basins.

4. Prior to granting of a waiver, and prior to or concurrent with submittal of development plans which would ordinarily require onsite stormwater storage, the applicant shall submit for review and approval analysis, design, and construction documents which will fulfill the requirements of items 2a and 2b above. Included as part of the submittal will be documentation which shows that the downstream property owners have been informed of and agree to the elements of the stormwater management plan which relate to their property. The applicant is responsible for acquiring written authorization and easements from downstream property owners to construct drainage improvements and alter historic flow courses or discharge amounts. The intent is that downstream property owners may authorize acceptance of limited increased pass-through stormwater flows but shall not be required to accept stormwater storage on their properties.

APPROVED
10/1/93 DH

5. The applicant shall prepare a Master Drainage Plan and Report for each of the two major watersheds in accordance with the City's Design Procedures and Criteria with particular emphasis regarding potential alluvial fan flooding on the northwest corner of the property. The two major watersheds are that area west of the McDowell Mountains drainage divide, which shall be defined as the area draining to the Central Arizona Project (CAP) Reach II Detention facility known as Dike No. 4, and that area east of the McDowell Mountains drainage divide, which shall be those areas draining to the Cactus Detention Basin located behind the CAP Canal at the Cactus Road alignment.

6. For the area west of the McDowell Mountain drainage divide the Master Report shall address, but not be limited to, the items lised in Schedule G and the following:

   a. Outline the issues arising from alluvial fan flooding which originates to the north of the subject property. Describe the obligations and alternatives the applicant has for managing the stormwater.
   b. Through coordination with City of Scottsdale staff, determine the best stormwater management alternative.
   c. Identify steps necessary to implement the management plan, including coordination with other parties/agencies, right-of-way acquisition, construction, funding options, etc.
   d. Prepare and submit cost estimates for the selected alternative, both interim and final construction.

7. For the area east of the McDowell Mountain drainage divide, the Master Plan and Report shall address the following:

   a. Conceptual location, configuration, sizing, and outlet arrangement for stormwater management facilities which comply with Scottsdale Revised Code Section 37-42(12). These facilities shall be designed to capture stormwater runoff from the developed portions of the site and shall not allow runoff from off-site or from undeveloped portions of the property to enter into them.

8. Applicant shall participate with city in the Lost Dog Wash Flood Control Project for that portion of the development located within the Lost Dog Wash watershed. Applicant's participation may consisst of in-kind contributions (including, but not limited to property dedications, engineering, construction) or of payments to city, or a combination of each of these. The dollar amount or in-kind contribution to be provided by applicant shall be determined by considering the following or other relevant factors:

   a. Stormwater runoff that will be caused by the development when completed, compared to runoff from the property in a natural condition.
   b. Percentage of the Lost Dog Wash watershed which is part of the development.
   c. The Lost Dog Wash Flood Control Project: Alternative Feasibility Analysis, Cost Estimate and Benefits Assessment Study ("Lost Dog Wash Study").

   The timing of and type of applicant's contribution shall be detailed in a development agreement, which must be executed within 12 months of acceptance by the City Council of the Lost Dog Wash Study or within 12 months of applicant's submittal of the Master Drainage Plan for the drainage area east of the McDowell Mountains, whichever occurs first.

APPROVED
10/1/93 DH
INITIALS

9. Until a final decision is made on the upstream detention features of the Lost Dog Wash Flood Control Project, the applicant shall plan and maintain open spaces in the vicinity of the west fork of Lost Dog Wash and the east property boundary (near the middle of Section 14, T3N, R5E, Gila and Salt River Base and Meridian), below the 1,850 foot elevation (City of Scottsdale Datum) to accommodate potential future detention facilities. Encroachment into this area shall be detailed in the agreement referenced in Drainage and Flood Control Stipulation No. 8 above.

   The applicant shall also take into consideration in the planning of the infrastructure for this area the potential for detention facilities (damsites and associated storage reservoirs) located at Sites C2, D and E as detailed in the Draft Lost Dog Wash Working Paper for Detention Basin and Channelization Alternatives dated October 22, 1991, revised November 13, 1991.

10. A drainage report fulfilling all requirements of city ordinances and Design Procedures and Criteria shall be submitted with each plat or development plan. Where exceptions to normal city requirements apply, the report shall reference the Master Plan Report, waiver form, or other documents of record which justify the exception.

11. At the time of preliminary plat submittal, the applicant shall delineate the 100-year fully developed conditions flood boundary of, and shall designate as a "special flood hazard area" any watercourse which has a tributary area of 320 acres or larger, or an estimated 100-year discharge of 500 cfs or greater. The "special flood hazard area" shall include the channel and any overbank portion of the floodplain. The "special flood hazard area" may, but is not required to, be expanded to include all or portions of any open space area that jointly utilizes the same space as the watercourse.

12. The U.S. Environmental Protection Agency requires a permit for construction activities which disturb 5 or more acres shall require a permit under the National Pollutant Discharge Elimination System (NPDES). A Notice of Intent (NOI), and a Storm Water Pollution Preventon Plan (SWPPP), must be filed with the Environmental Protection Agency and the City before development permits can be issued. Contact the Stormwater Hotline at (703)821-4823 or Project Review at 994-7887 for more information.

13. A Section 404 permit from the U.S. Army Corp of Engineers may be required for discharges of dredged or fill materials within jurisdictional washes. Contact the Phoenix Regulatory Office of the Corps of Engineers for a jurisdictional determination and further information. Written communication with the State Historic Preservation Officer may be required as part of the 404 permit process.

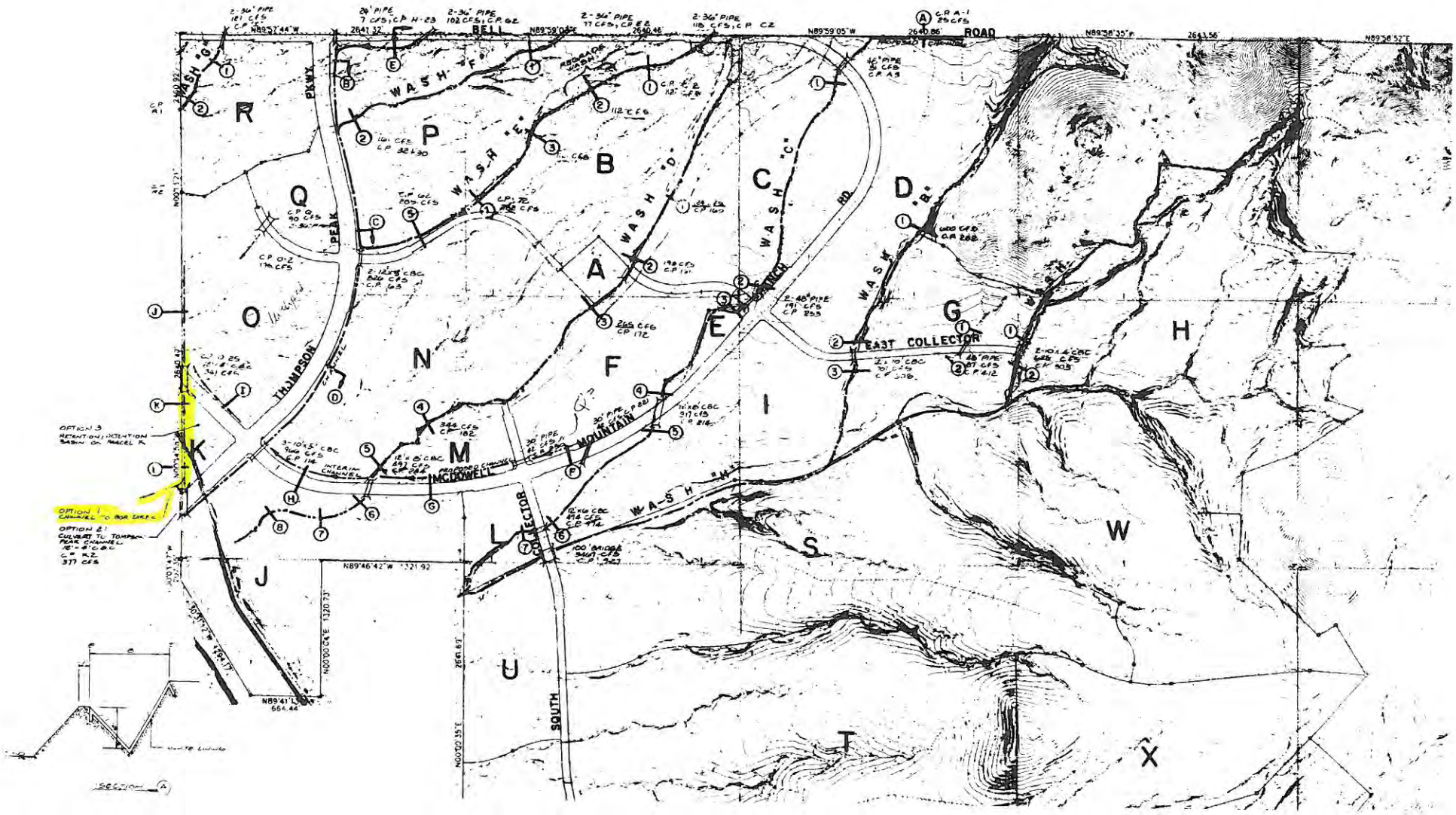
14. As required by city Ordinance, the applicant must submit evidence that all State and Federal permits have been obtained before the city can issue any development permits (this includes 404 permits).

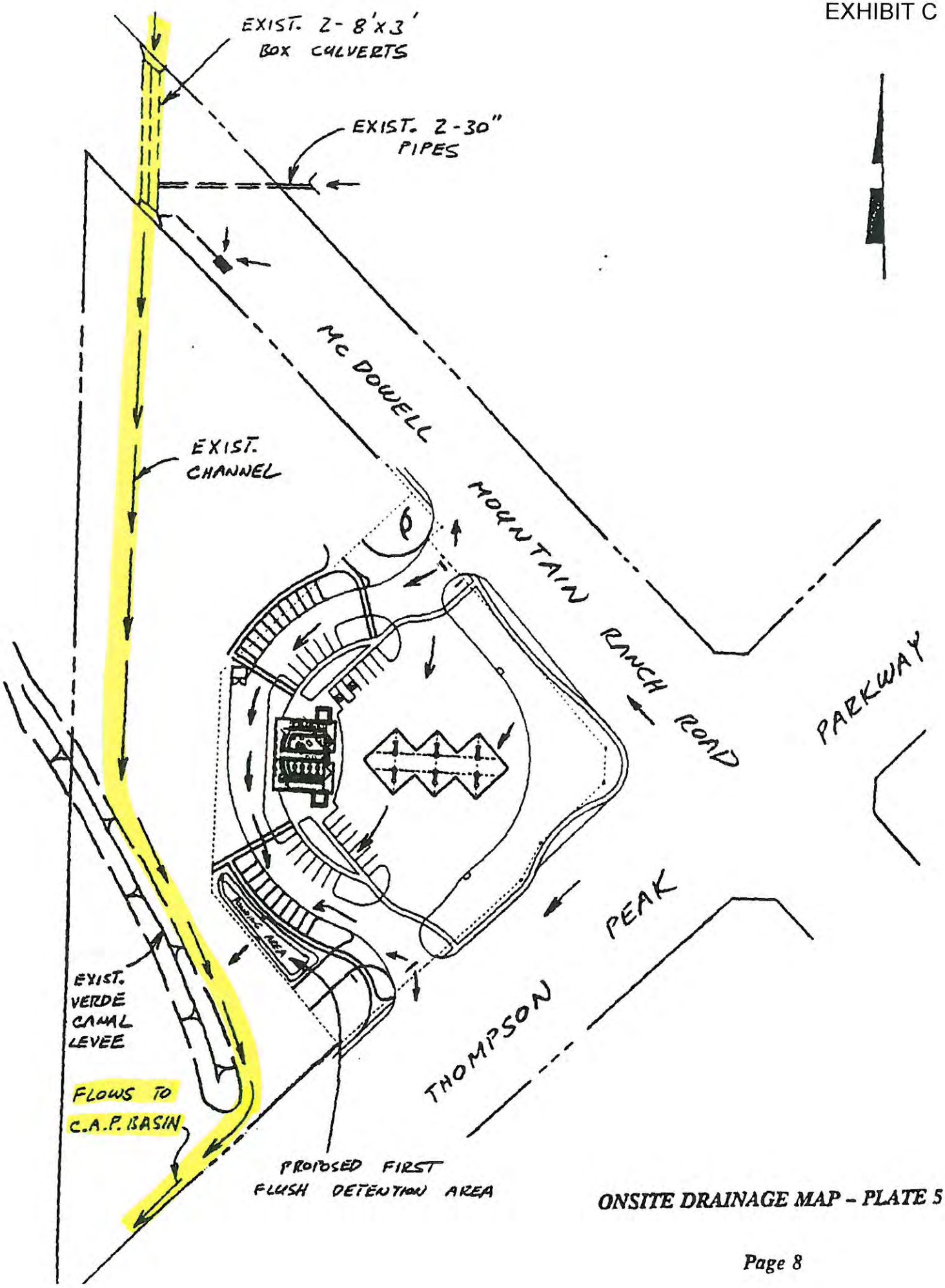
APPROVED
10/1/93 DN
DATE

EXHIBIT B

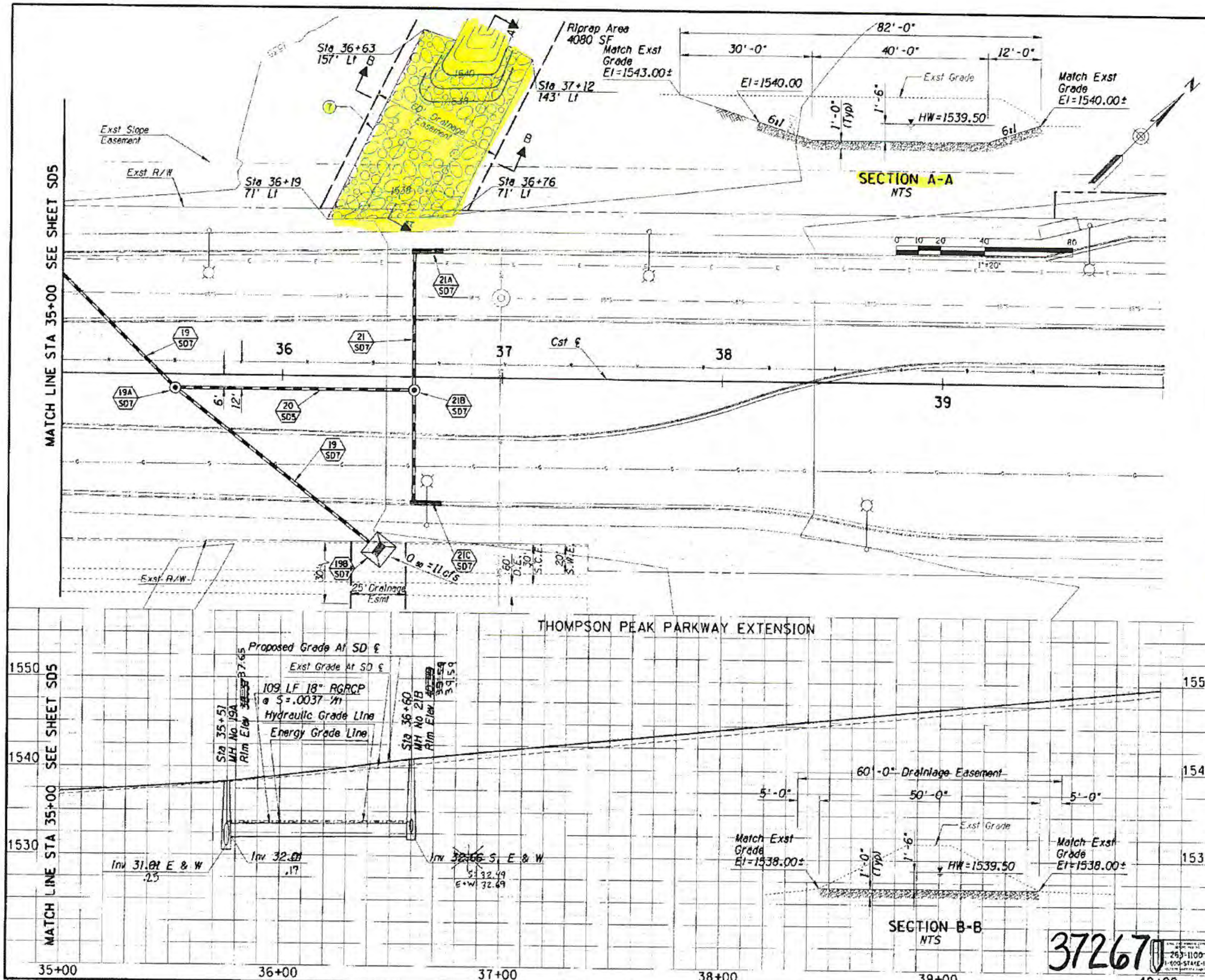
DRAINAGE MASTER PLAN
FOR
MCDOWELL MOUNTAIN RANCH

1688 CROUSE ENG





ONSITE DRAINAGE MAP – PLATE 5



RUST ENVIRONMENT & INFRASTRUCTURE

CATCH BASINS

CB No.	Station	Type	Offset
19B	36+44	Flush, ADOT D+I C-15.80	78' Rt
21A	36+60	COP Dtl P1567, K14	57.16' Lt
21C	36+60	COP Dtl P1567, K14	57.16' Rt

MANHOLES

MH No.	Station	Type	Offset
19A	35+51	MAG Dtl 424, 520, 522	6' Rt
21B	36+60	MAG Dtl 424, 520, 522	6' Rt

PIPE

Line No.	Station	Size	L (LF)
19	35+51	30" RGRCP	188
20	35+51 to 36+60	18" RGRCP	109
21	36+60	18" RGRCP	112

CONSTRUCTION NOTES

(7) Grade Area To New Contours Shown. Install 1400 S.Y. Riprap. See Section A-A This Sheet

SHEET NOTES:

For Paving Plans, See Sheet P14
For Connector Pipe Profiles, See Sheet SD9
For Water Line Plans, See Sheet W6
For Right-Of-Way Limits, See Sheet P1

STORM DRAIN PLAN STA 35+00 TO 40+00

MUNICIPAL SERVICES DEPARTMENT
CAPITAL PROJECT MANAGEMENT
7575 CIVIC CENTER BLVD. SCOTTSDALE, ARIZONA 85251

THOMPSON PEAK PARKWAY EXTENSION
100TH ST TO McDOWELL MOUNTAIN RANCH RD

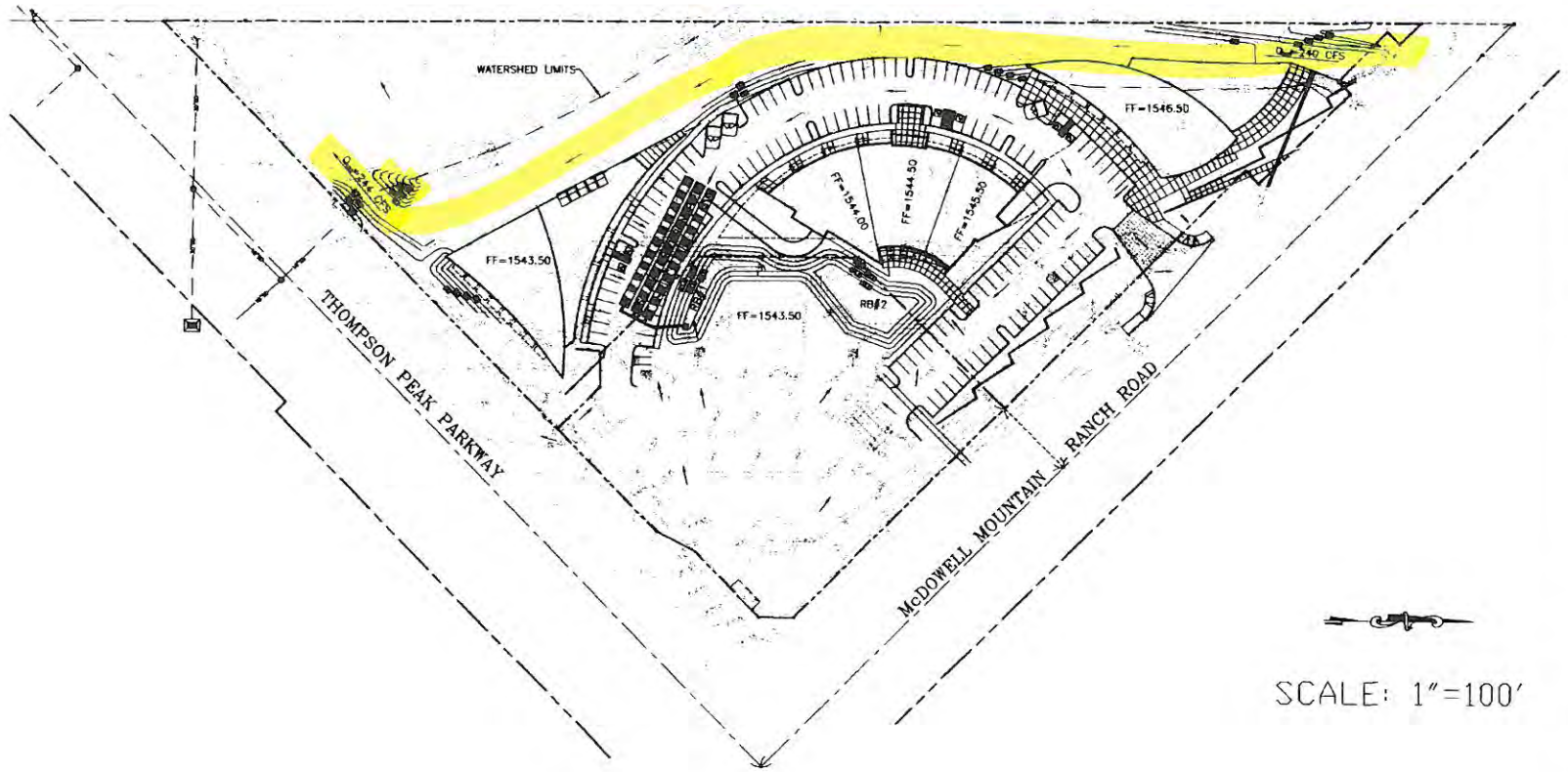
37267

EXHIBIT D

81 DR 97 1034 E 97 43 NP 97

EXHIBIT E

-DRAINAGE EXHIBIT-
DEVELOPED CONDITION



SCALE: 1"=100'

J. M. GRIFFIN ENGINEERING, INC.
CIVIL ENGINEERING
LAND PLANNING
745 E. MARYLAND AVE., STE. 200
PHOENIX, ARIZONA 85014
T. 602.212.1279 F. 602.212.1553

REVISIONS:
REV. 1
REV. 2

DESIGN BY: J.A.S
DRAWN BY: J.A.S
SCALE:
DATE: JAN. '03

JOB No.: 0236

1of 1

APPENDIX D

RIO VERDE CANAL – CORRESPONDENCE FROM RICHARD ANDERSON

Wade Cooke

Subject: FW: Drainage Proposal - Bell/Thomas/Weiss letter attached
Attachments: 03.13.19 23-ZN-2018 Drainage Proposal to COS.pdf

From: Anderson, Richard
Sent: Thursday, April 11, 2019 10:44 AM
To: 'Mike Leary' <michaelpleary@cox.net>
Cc: Grant, Randy <RGrant@Scottsdaleaz.gov>; Couch, Ashley <ACouch@ScottsdaleAz.Gov>; Clack, Michael <MCLACK@scottsdaleaz.gov>; Venker, Steve <JVenker@Scottsdaleaz.gov>; McClay, Doris <DMcClay@scottsdaleaz.gov>
Subject: FW: Drainage Proposal - Bell/Thomas/Weiss letter attached

Mike,

Thanks to you and your clients for having prepared and submitting the attached drainage proposal.

We have reviewed the proposal and have the following review comments:

In general, the stormwater management design presented in the proposal is acceptable to the City's Stormwater Management subject to two conditions or stipulations which we have discussed in our past meetings on this issue. The following will provide some clarification and direction on those conditions:

> The first condition is approval by the Arizona State Land Department (ASLD) for impacts to their parcel located downstream of the proposed outlet channel. The proposal would result in significant increases in stormwater flows within the existing remnant wash within the ASLD parcel relative to the existing condition. There currently appears to be little flow within this remnant wash; implementation of the drainage proposal would result in 100-year flows of over 200 cubic feet per second within this wash. However, based on a cursory analysis, this existing remnant wash would likely contain the proposed 100-year flows within the banks of the wash due to its size and depth. With respect to process and the required work relating to obtaining State approval, the City is willing to assist in conversations and meeting with the State on this issue, but the developments/parcels will need to make the application to the state.
>
> The second condition would be approval by Westworld for drainage-related impacts to its facilities in general including the existing maintenance facility crossing of the aforementioned remnant wash including mitigation of adverse impacts to the same. Based on a recent field investigation, the driveway for the maintenance facility appears to be an at-grade crossing. There is also a sewer line with manhole, a potable water line and non-potable water line contained within the crossing that would be affected by increases in flows. An exhibit of the area from the City's LIS showing these facilities is provided below. Additionally, this condition would need to address potential adverse impacts to these utilities in general. Again, the submitted drainage proposal would significantly increase flows within the wash and this crossing which could washout the crossing as well as affect the existing utilities. Stormwater staff will plan on contacting or meeting with staff from Westworld to discuss and evaluate this issue to determine needed requirements or mitigation.

With respect to stormwater storage for the properties, consistent with City code, the default stormwater storage requirement for the properties is full (100-year, 2-hour) storage. Since the properties are within the City's Environmentally Sensitive Lands (ESL) area, the development can obtain approval for a storage volume that is reduced from full storage based on providing an analysis that shows no increase in developed condition outflows from the properties from the existing condition. Further, it appear the properties could pursue a full waiver of stormwater storage requirements based on waiver criteria 1 which is based on adequate capacity of downstream facilities to convey additional runoff. In the event a full stormwater storage waiver is approved, the properties would need to pay the in-

lieu fee of $3.00 per cubic foot for the volume waived above the pre versus post requirements in addition to the existing volume within the gas station parcel. These requirements and the potential waiver all appear to be consistent with the McDowell Mountain Ranch Zoning stipulations affecting the storage and gas station parcels which were part of McDowell Mountain Ranch. In the event a full stormwater storage waiver is approved, development of the properties would still need to address the first flush requirement by alternative measures that are acceptable to stormwater management. Additionally, if a full stormwater storage waiver is approved, the 100-year flow rates affecting ASLD land and Westworld would be higher than the existing off-site flows affecting the area due to the additional runoff from development; these higher flow rates would need to be considered by the City and State as part of the evaluation of the proposal for impacts to Westworld/City utilities, and State land.

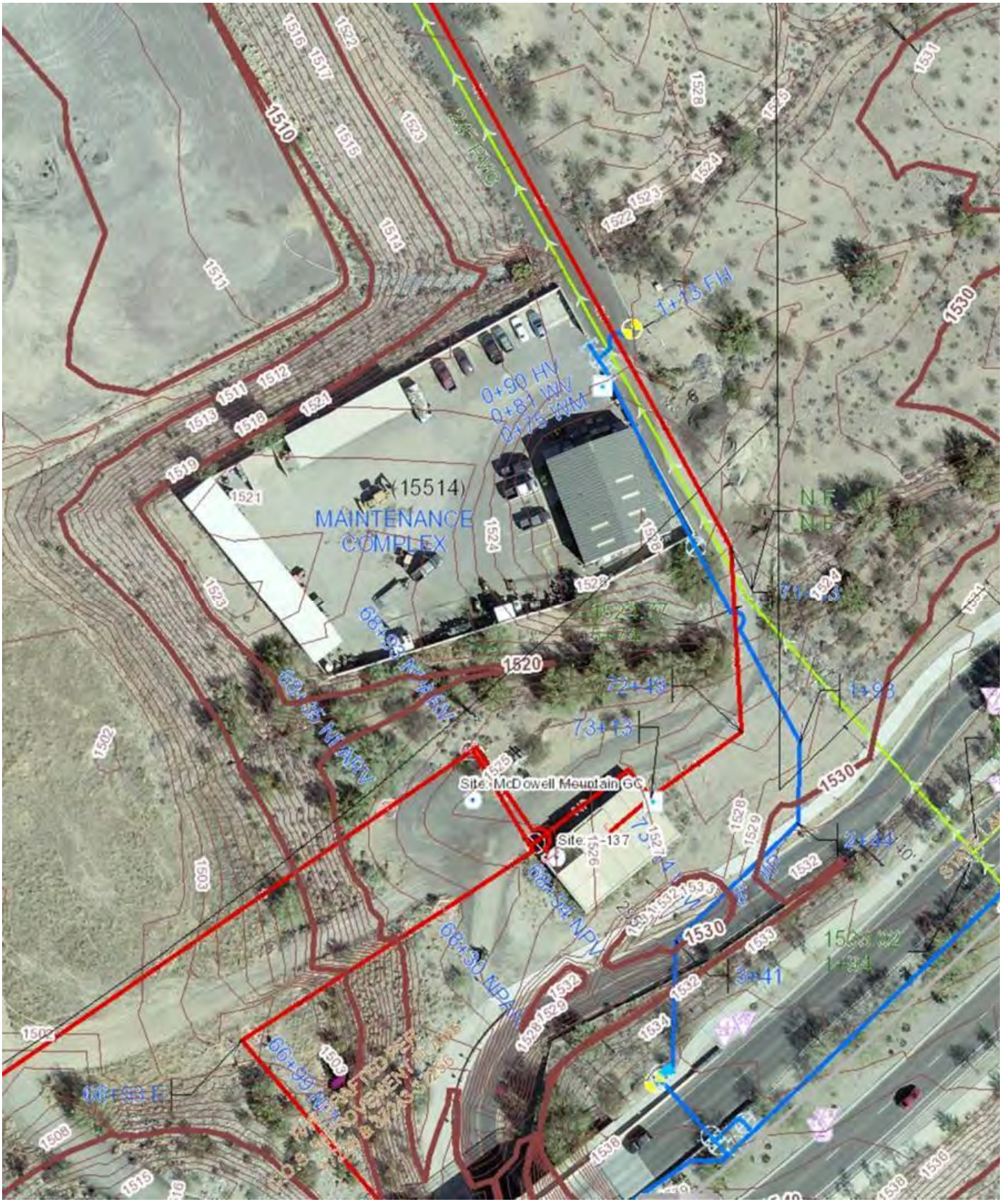
The submitted drainage proposal will need to be further developed into a drainage master plan for the included parcels and submitted to the City for review and approval. The report will need to include and analyze off-site hydrology including any existing flow into the remnant wash within state lands; a preliminary grading and drainage/improvement plan for the Rio Verde Canal breach and proposed channel grading; on-site hydraulics and 100-year floodplain determination for the larger off-site flow through the parcels, State land, and Westworld to the basin downstream; hydraulic and scour calculations for the maintenance driveway crossing for the existing condition and supporting design and documentation for any modifications; an analysis of required stormwater storage volumes and/or a stormwater storage waiver application and supporting calculations.

Please keep in mind that the comments provided at this time are stormwater related only and do not include or reflect the issues or requirements of other review disciplines from the City that may be affected by the proposal. The proposed channel extension appears to be located within existing NAOS; Current Planning will need to weigh in on that issue. The proposed channel extension will also include substantial grading to the Rio Verde Canal for the proposed breach of the canal which, as you are aware, impacts the City's desire to preserve this facility as part of the City's Historical Preservation Program.

Please review and let me know if you have any questions or need any clarifications.

Thanks again for your patience working with us to resolve this difficult issue.

Richard M. Anderson, P.E., CFM
Stormwater Engineering Manager
Stormwater Management
City of Scottsdale
Phone: 480-312-2729
Fax: 480-312-9202


(15514)
MAINTENANCE COMPLEX
Site: McDowell Meuntain GC
Site: -137
1+15 FH
0+90 HV
0+81 IMV
0+75 IMM
72+45
73+13
1+93
2+44
3+41
1510
1520
1530

From: mike leary <outlook_59CA1EDED17AAFFC@outlook.com> **On Behalf Of** mike leary
Sent: Friday, March 15, 2019 4:52 PM
To: Anderson, Richard <Rianderson@scottsdaleaz.gov>
Cc: Gerkin, Don <Dgerkin@scottsdaleaz.gov>; Couch, Ashley <ACouch@ScottsdaleAz.Gov>; Grant, Randy <RGrant@Scottsdaleaz.gov>; McClay, Doris <DMcClay@scottsdaleaz.gov>; george bell <ghbell@landrd.com>; George H. Bell III <george.bell@landrd.com>; John Thomas <thomasjg@cox.net>; steve weiss <sweiss5@cox.net>; Macey Weiss, Esq <weiss@vestmontinc.com>; Jim Elson <j4747e@aol.com>
Subject: Drainage Proposal - Bell/Thomas/Weiss letter attached

Richard attached is the drainage proposal prepared by our civil engineer in concert with Len Erie and supported by the three affected property owners.

As stated in the cover letter please review with your staff and let us know ASAP how the City can help reaching a mutually beneficial solution and method of implementation as the scheduled closing on the storage property is fast approaching

Thanks! ML

Mike Leary
Michael P. Leary, LTD
Commercial Real Estate Development Consulting

10278 East Hillery Drive
Scottsdale, AZ 85255
(c) 480.991.1111

APPENDIX E

STORMWATER STORAGE CALCULATIONS

MMR Commons
STORMWATER STORAGE CALCULATIONS

5/10/2019

STORAGE VOLUME REQUIRED:

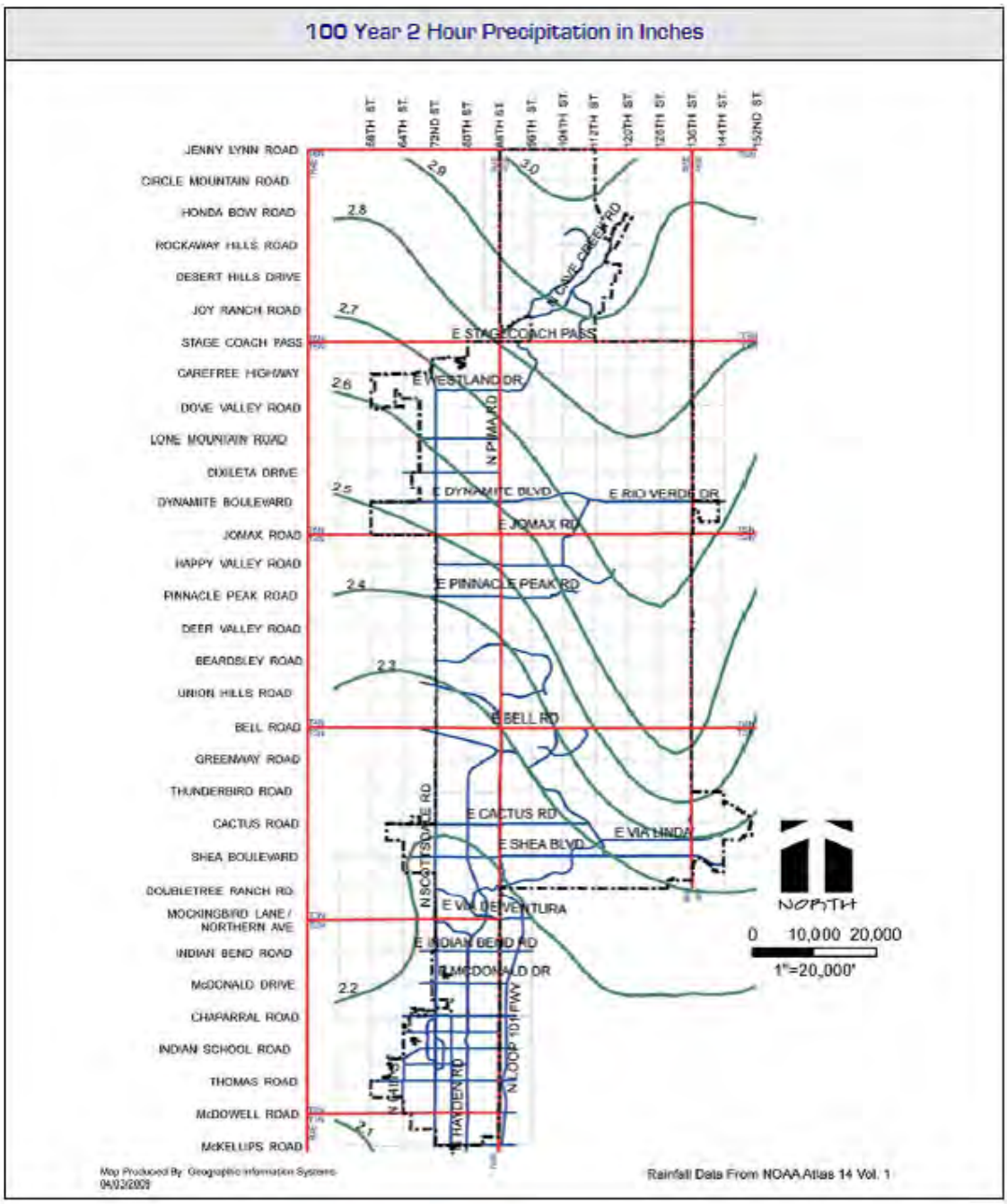
	Area (S.F.)	Area (AC.)	Pre/Post Vr Volume (C.F.)	First Flush Vff Volume (C.F.)
DA-1	127,689	2.93	10,296	5,320
DA-2	73,158	1.68	5,899	3,048
DA-3 (Street)	24,440	0.56	1,971	
Area (gross)	225,287	5.17	**18,166**	**8,369**

Cpre =	0.45
Cpost =	0.86
Cpre/post =	0.41 (0.86 - 0.45)
Cff =	1.00
P =	2.36 inches
Pff =	0.50 inches
V =	(P/12) x A x C

STORAGE VOLUME PROVIDED:

Contour Elevation	Area (S.F.)	Avg. Area (S.F.)	Depth (FT)	Vp Volume (C.F.)
Retention Basin (DA1)				
27	5,118			
26	2,724	3,921	1.0	3,921
25	864	1,794	1.0	1,794
				5,715
Retention Basin (DA2)				
31	5084			
30	3,829	1,255	1.0	1,255
29	2,457	3,143	1.0	3,143
				3,143
			Total Volume (Vp) =	**8,858**
		Waiver Volume =	**Vr - Vp =**	**9,308**

ISOPLUVIALS



APPENDIX F

STORMWATER STORAGE WAIVER

Request for Stormwater Storage Waiver

City of Scottsdale Plan/Case Numbers:

____ - DR - ___ ____ - PP - ____ PC#_____

Requests for stormwater storage waivers are reviewed as part of case submittals for the associated project. This form should be included in the preliminary drainage report with the applicant's portion completed. The preliminary drainage report shall include supporting documentation and analysis as needed to support the requested wavier.

Date 5/11/19 Project Name McDowell Mountain Ranch Commons

Project Location 9909 E McDowell Mountain Ranch Road

Applicant Contact Wade Cooke, P.E. Company Name Landcor Consulting

Phone 480-223-8573 E-mail wade@landcorconsulting.com

Address 6859 E. Rembrandt Ave, #124, Mesa, AZ 85212

Waiver Criteria

A project must meet at least one of three criteria listed below for the city to consider waiving some or all required stormwater storage. **However, regardless of the criteria, a waiver will only be granted if the applicant can demonstrate that the effect of a waiver will not increase the potential for flooding on any property.** Check the applicable box and provide a signed and sealed engineering report and supporting engineering analysis that demonstrate the project meets the criteria and that the effect of a waiver will not increase the potential for flooding on any property.

If the runoff for the project has been included in a storage facility at another location, the applicant must demonstrate that the stormwater storage facility was specifically designed to accommodate runoff from the subject property and that the runoff will be conveyed to this location through an adequately designed conveyance facility.

It should be noted that reductions in stormwater storage relating to

☑ 1. The development is adjacent to a conveyance facility that an engineering analysis shows is designed and constructed to handle the additional runoff from the site as a result of development.

☐ 2. The development is on a parcel less than one-half acre in size.

☐ 3. Stormwater storage requirements conflict with requirements of the Environmentally Sensitive Lands Ordinance (ESLO).

For a full storage waiver, a conflict with ESLO is limited to:

- Property located in the hillside landform as defined in the city Zoning Ordinance
- Property in the upper desert landform that has a land slope steeper than 5% as defined in the city Zoning Ordinance
- Property within the ESL zoning overlay district where the only viable location for a stormwater storage basin requires blasting

This full waiver only applies to those portions of property meeting one of these three requirements.

100-year/2-hour storage is allowed, but not required for redevelopment projects and development within the ESL zoning overlay. Rather, these projects must store enough stormwater to attenuate post-development flows to predevelopment levels, considering the 10- and 100-year storm events (S.R.C. Sections 37-50 and 37-51).

By signing below, I certify that the stated project meets the waiver criteria selected above as demonstrated by the attached documentation.

_____ _____

Stormwater Management Department

7447 E Indian School Road, Suite 125, Scottsdale, AZ 85251 ◆ Phone: 480-312-2500

Request for Stormwater Storage Waiver

City of Scottsdale Plan/Case Numbers:

____ - DR - ___ ____ - PP - ____ PC#_____

CITY STAFF TO COMPLETE THIS PAGE

Project Name McDowell Mountain Ranch Commons

Check Appropriate Boxes:

☐ Meets waiver criteria (specify): ☐ 1 ☐ 2 ☐ 3

Recommended Conditions of Waiver:

☐ All storage requirements waived.

☐ Post-development peak discharge rates do not exceed pre-development conditions.

☐ Other:

Explain: _____

_____

☐ **Waiver approved per above conditions.**

_____ _____

Floodplain Administrator or Designee Date

Stormwater Management Department

7447 E Indian School Road, Suite 125, Scottsdale, AZ 85251 ◆ Phone: 480-312-2500

Request for Stormwater Storage Waiver

City of Scottsdale Plan/Case Numbers:

____ - DR - ___ ____ - PP - ____ PC#_____

In-Lieu Fee and In-Kind Contributions

In-lieu fees are only applicable to projects where post-development peak discharge rates exceed pre-development levels, based on the 10- and 100-year storm events. If the city grants a waiver, the developer is required to calculate and contribute an in-lieu fee based on what it would cost the city to provide a storage basin, sized as described below, including costs such as land acquisition, construction, landscaping, design, construction management, and maintenance over a 75-year design life. The fee for this cost is $3.00 per cubic foot of stormwater storage for a virtual storage basin designed to mitigate the increase in runoff associated with the 100-year/2-hour storm event. The applicant may submit site-specific in-lieu fee calculations subject to the Floodplain Administrator's approval.

The Floodplain Administrator considers in-kind contributions on a case-by-case basis. An in-kind contribution can serve as part of or instead of the calculated in-lieu fee. In-kind contributions must be stormwater-related and must constitute a public benefit. In-lieu fees and in-kind contributions are subject to the approval of the Floodplain Administrator or designee.

Project Name McDowell Mountain Ranch Commons

The waived stormwater storage volume is calculated using a simplified approach as follows:

$V = \Delta CRA$; where
V = stormwater storage volume required, in cubic feet,
ΔC = increase in weighted average runoff coefficient over disturbed area ($C_{post} - C_{pre}$),
R = 100-year/2-hour precipitation depth, in feet (DSPM, Appendix 4-1D, page 11), and
A = area of disturbed ground, in square feet

Furthermore,

$V_w = V - V_p$; where
V_w = volume waived,
V = volume required, and
V_p = volume provided

R = 2.36
ΔC= .41
A = 225,287
V = 9,308
V_p= 18,166
V_w= 8,858

☑ An in-lieu fee will be paid, based on the following calculations and supporting documentation:
In-lieu fee ($) = V_w (cu. ft.) x $3.00 per cubic foot = $26,574

☐ An in-kind contribution will be made, as follows:

_____
_____
_____

☐ No in-lieu fee is required. Reason:

_____
_____

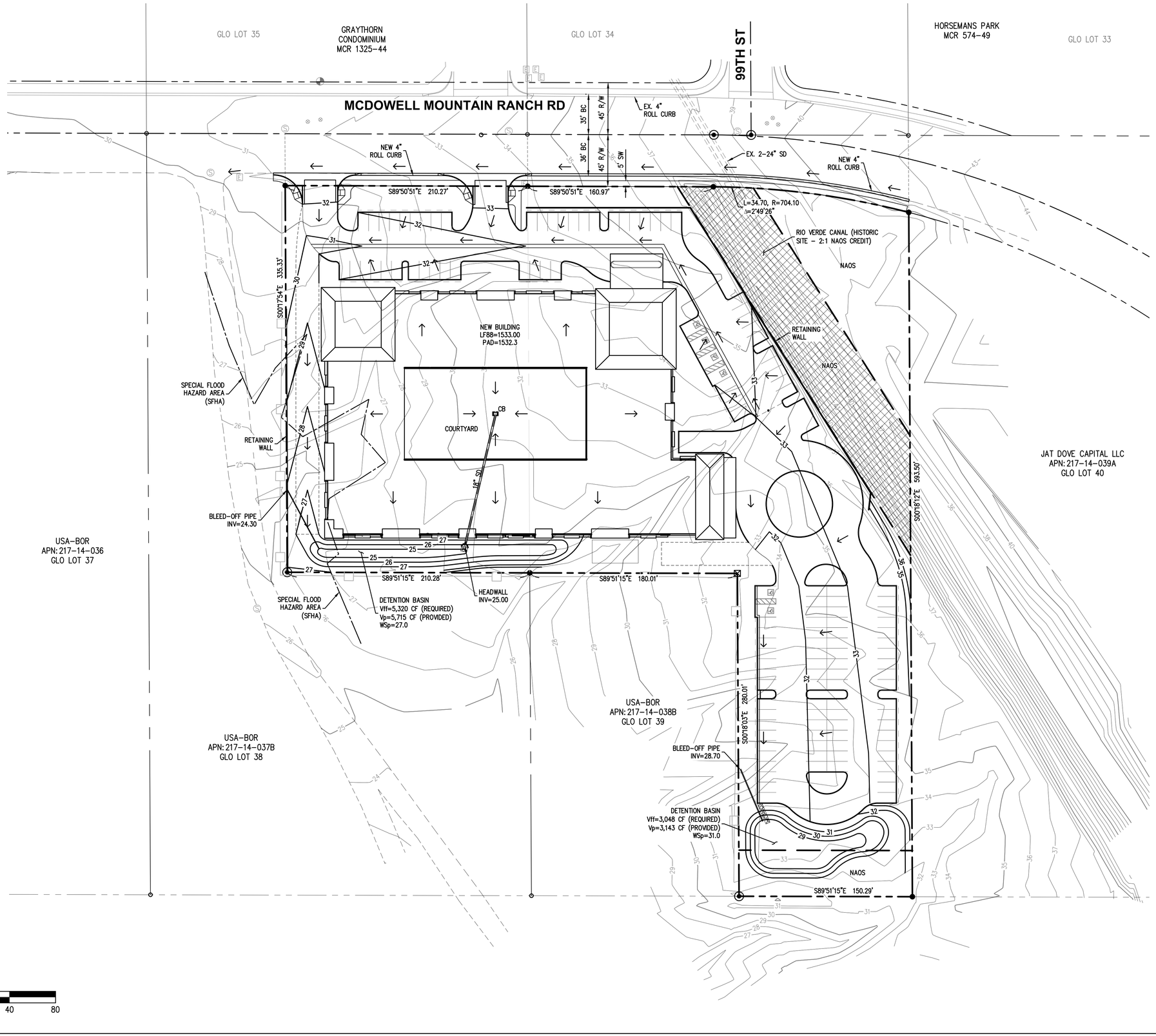
Approved by:

_____ _____
Floodplain Administrator or Designee Date

Stormwater Management Department
7447 E Indian School Road, Suite 125, Scottsdale, AZ 85251 ◆ Phone: 480-312-2500

POCKET FOLDER

PRELIMINARY GRADING & DRAINAGE PLAN



PRELIMINARY NOT FOR CONSTRUCTION

Registered Professional Engineer (Civil) CERTIFICATE NO. 33981 WADE E. COOKE Date Signed 5/10/19 ARIZONA, U.S.A.

RYAN

RYAN A+E, INC.
3900 E. Camelback Road, Ste 100
Phoenix, AZ 85018
602-322-6100 tel
602-322-6300 fax

WWW.RYANCOMPANIES.COM

OWNER

CONSULTANTS

LANDCOR CONSULTING
6859 E. Rembrandt Ave. #124
Mesa, Arizona 85212
Ph: (480) 223-8573
landcorconsulting.com

PROJECT INFORMATION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Architect under the laws of the State of Arizona

Wade E. Cooke, P.E.

REGISTRATION NO.	DATE
33981	5/10/19

DRAWN BY	CHECKED BY
Author	
JOB NO.	DATE

ZONING 99-2019

ZONING PACKAGE

05.10.19